

WHAT IS CLAIMED IS:

1. A projector comprising:

a roughly box-type projector main body;

a projection lens exposed on the front side of said projector main body;

a front cover for opening and closing the front side of said projection lens; and

a left-right pair of double hinge mechanisms for turnably supporting both left and right end portions of said front cover on said projector main body,

wherein said left-right pair of double hinge mechanisms comprise:

a pair of first and second parallel hinge pins having one-side ends supported respectively on said front cover and said projector main body; and

hinge arms rectangularly connecting the other-side ends of said first and second hinge pins,

said front cover can be turned between a storage position of being roughly vertically disposed on the front side of said projector main body to cover the front side of said projection lens and an open position of being turned to an upper portion of said projector main body to open the front side of said projection lens.

2. A projector as set forth in claim 1, wherein

said storage position of said front cover is formed in a recessed portion provided on the front side of said projector main body, and said front cover is stored by being rectangularly disposed in said recessed portion.

3. A projector as set forth in claim 1, wherein the inner side of said front cover for closing said projection lens is constructed to be a control panel.

4. A projector as set forth in claim 3, wherein the surface of said control panel of said front cover is inclined to be directed skewly rearwardly upward when said front cover is turned to the open position at said upper portion of said projector main body.

5. A projector comprising:

a roughly box-type projector main body;

a projection lens exposed on the front side of said projector main body;

a front cover for opening and closing the front side of said projection lens; and

a left-right pair of double hinge mechanisms for turnably supporting both left and right end portions of said front cover on said projector main body,

wherein said left-right pair of double hinge mechanisms comprise:

a pair of first and second parallel hinge pins

having one-side ends supported respectively on said front cover and said projector main body; and

hinge arms rectangularly connecting the other-side ends of said first and second hinge pins,

said front cover can be turned between a storage position of being roughly vertically disposed on the front side of said projector main body to cover the front side of said projection lens and an open position of being turned to an upper portion of said projector main body to open the front side of said projection lens, and

said projector further comprises:

a means for locking and unlocking said front cover at said storage position;

a first rotation energizing means for turningly energizing said front cover to the upper side relative to said hinge arms; and

a second rotation energizing means for turningly energizing said front cover to the rear upward side relative to said hinge arms,

said first and second rotation energizing means disposed respectively at the outer peripheries of said first and second hinge pins of one of said double hinge mechanisms.

6. A projector as set forth in claim 5, wherein

said one of said double hinge mechanisms comprises:

a first rotation mode in which said front cover is rotated upward by about 180° with said first hinge pin as a center by said first rotation energizing means, through unlocking of said front cover at said storage position; and

a second rotation mode in which, after the end of said first rotation mode, said front cover is rotated to the rear side by about 90° with said second hinge pin as a center by said second rotation energizing means.

7. A projector as set forth in claim 5, wherein said one of said double hinge mechanisms comprises a pair of dampers different in rotational load for performing said first rotation mode and said second rotation mode.

8. A projector as set forth in claim 5, wherein said first and second rotation energizing means are each composed of a torsion coil spring.

9. A projector as set forth in claim 5, wherein said storage position of said front cover is formed in a recessed portion provided at the front side of said projector main body, said front cover is stored by being vertically disposed in said recessed portion, a left-right pair of opposite surfaces in said recessed portion opposed to left and right end faces of said front cover

are provided with a left-right pair of hook portions, said left and right end faces of said front cover are provided with engaging portions for engagement with said left-right pair of hook portions, and one of said left-right pair of hook portions is constructed to be said locking and unlocking means.

10. A projector comprising:

a roughly box-type projector main body;

a projection lens exposed on the front side of said projector main body;

a front cover for opening and closing the front side of said projection lens; and

a loudspeaker incorporated in said front cover and projected to an upper portion of said projector main body when said front cover is moved from a storage position in which said front cover covers the front side of said projection lens to an open position in which said front cover is moved to an upper portion of said projector main body to open the front side of said projection lens.

11. A projector as set forth in claim 10, wherein said loudspeaker is directed skewly rearwardly upwards when said front cover is moved to said open position at the upper portion of said projector main body.

12. A projector as set forth in claim 10, wherein

4004339 04002
a hinge mechanism is provided for turning said front cover relative to said projector main body between said storage position and said open position, and said loudspeaker is disposed on the inner side of said front cover for closing said projection lens so that said loudspeaker is directed to the upper side or the skewly rear upper side of said projector main body when said front cover is rotated from said storage position to said open position by said hinge mechanism and said inner side of said front cover is directed upwards or skewly rearwardly upwards.

13. A projector as set forth in claim 10, wherein said hinge mechanism is provided with a hollow hinge pin, and a wiring for connection between a circuit in said projector main body and said loudspeaker and/or a control panel substrate incorporated in said front cover is passed through said hollow hinge pin.